

COBRA ECOLOGY TEST

PART A

1. Lichens are an example of a primary producer that combine photosynthesis by algae (or nitrogen fixation by Cynobacteria) with the protection of a decomposer fungus. This is an example of:
 - A. Mutualistic symbiosis
 - B. Commensalism
 - C. Parasitism
 - D. Amensalism
2. A termite consumes wood, but it cannot digest it without the help of protozoans in the termite's gut that break down the cellulose to a form that the termite can metabolize. Thus, the termite supplies food for the Protozoan, and the protozoan provides food for the termite. This kind of relationship is called:
 - A. Degenerate parasitism
 - B. Endosymbiosis
 - C. Commensal insects
 - D. None of the above
3. The number one cause of deforestation worldwide is:
 - A. Commercial logging
 - B. Wildfire
 - C. Clearing of lands for agricultural use
 - D. Gathering of firewood
 - E. Building of roads and cities.
4. The total amount of living tissue within a given trophic level is called the
 - A. Organic mass.
 - B. Trophic mass
 - C. Energy mass
 - D. Biomass
5. What ecological process describes how a community develops on newly exposed land such as a cooled lava flow or land exposed by a receding glacier?

- A. Succession
- B. Adaptation
- C. Acclimation
- D. Evolution

6. Ammonification is:

- A. The process by which plants absorb ammonium through root hairs to be used within the plant
- B. The process of oxidizing ammonia to create nitrite (NO_2^-) then oxidizing the nitrite to create nitrate (NO_3^-)
- C. The process by which decomposers change nitrogen in detritus to ammonium
- D. All of the above

7. The manner in which a biological taxon is spatially arranged is:

- a. Species Dispersal
- b. Species Distribution
- c. Niche Distribution
- d. Ecological Dispersal

8. Which of the following survivorship curves applies to perennial plants?

- A. Type I
- B. Type II
- C. Type III
- D. Type IV
- E. Both B and C

9. The biodegradation of materials by aerobic microorganisms resulting in the production of carbon dioxide, water, and other mineral products is termed

- A. Aerobic Decomposition
- B. Biodegradation
- C. Cellular respiration
- D. Hydrologic cycle
- E. None of the above

10. The hydrologic cycle follows _____ as it travels through the atmosphere and planet's surface.

- A. Hydrogen
- B. Hydrogen Peroxide

- C. Dihydrogen Oxide
- D. Dihydrogen monoxide
- E. None of the above

11. What three main elements are used in fertilizers?

- A. Nitrogen, Permanganate, Krypton
- B. Permanganate, Hydrogen, Potassium
- C. Nitrogen, Phosphorus, Potassium
- D. Oxygen, Hydrogen, Calcium
- E. The three main elements in fertilizer's differs from company to company

12. How many tons of carbon can 1cm of plant material hold?

- A. 4
- B. 3.5
- C. 3
- D. 2.5
- E. 2

13. What term uses various analytical techniques to study genes in an evolutionary and ecological context.

- A. Genetics
- B. Evolution Ecology
- C. Molecular Ecology
- D. Bio-engineering
- E. None of the above

14. The term 'ecology' was first coined by

- A. Charles Darwin
- B. Ernst Haeckel
- C. Antoni Leeuwenhoek
- D. Richard Bradley
- E. None of the above

15. In addition to his work on evolution Charles Darwin was one of the founders of

- A. Soil Ecology
- B. Social Darwinism
- C. Botany United
- D. The HMS Science Expedition

16. Solid Waste is compacted into landfills lined with _____ to prevent leachate from contaminating ground water.

- A. metal liners
- B. gravel
- C. Compacted asphalt
- D. synthetic liners

17. According to EPA regulations, after a landfill is closed, owners must monitor and maintain the sites for how many years?

- A. 30
- B. 50
- C. 20
- D. 25

18. What is the best way to help prevent groundwater pollution from landfills after they have been shut down?

- A. To help prevent leaking from landfill sites, leachate is disposed of in deep-well disposal sites where waste is pumped into porous geologic formations beneath aquifers.
- B. The best solution to the leachate problem is to apply clean water continuously to the landfill and collect the resulting leachate in a treatment monitoring system. After 10-20 years, little pollution is left.
- C. The leachate problem can be solved by pumping toxins to an above ground storage facility and treated so they can be released into the environment.
- D. There is no solution to this problem.

19. Earth's sustainability is

- A. the rate of the earth's use of natural resources and the use of renewable resources over time.
- B. the rate at which the maximum number of organisms over a particular area can use its resources over a given time period.
- C. the external conditions that make up the ecosystem.
- D. the rate of the earth's supplies of resources and the processes that make up earth capital are used and maintained indefinitely.

20. Bioremediation can be used to clean up all these EXCEPT

- A. organic wastes
- B. contaminated groundwater
- C. toxic metals
- D. small oil spills

21. Why is biodiversity loss perhaps the most critical environmental problem of our time?

- A. Loss of biodiversity can lead to a more balanced ecosystem.
- B. Loss of biodiversity can lead to changes in population and species and disrupt ecological processes.
- C. Loss of biodiversity has no effect on the ecosystem of the planet.
- D. It is the most critical issue because decreasing biodiversity helps maintain biological wealth.

22. What is overgrazing?

- A. When grasslands grow out of control and primary succession begins to take place.
- B. Occurs when not enough animals are present to control the grass's growth rates.
- C. Occurs when too many animals are grazing on one area for too long.
- D. When small populations of grazing animals eat some patches of grasses.

23. What are biodigesters?

- A. Piece of equipment that produces gases such as methane from the decomposition of organic materials.
- B. Piece of equipment used to produce biogas for heating.
- C. Piece of equipment used to produce carbon dioxide, hydrogen sulfide, and fuel gases from decomposition of organic material.
- D. All of the above

24. What environmental damage is caused from mercury?

- A. When in water, mercury will contaminate fish and mollusks and accumulate in the food chain.
- B. When in the environment, mercury does not pose a problem to the ecosystem.
- C. Mercury can damage the circulatory systems of organisms and bioaccumulate.
- D. Mercury can damage waterways by increasing turbidity.

25. A species that has an unusually important role in the structure of an ecological community is known as what?

- A. Keystone species
- B. Foundation species
- C. Founder species
- D. Indicator species

26. A population of mule deer was growing very quickly until starvation reduced the number of individuals. The mule deer passed the condition or point of

- A. Overcrowding
- B. Exponential growth
- C. Carrying capacity
- D. Limited growth

27. Which of the following is an example of a mutualistic relationship?

- A. A tapeworm living in an organism's stomach
- B. A duck eating algae
- C. A dolphin searching for a mate
- D. Algae living in coral

28. Which criteria pollutants contribute to acid precipitation?

- I. Nitrogen dioxide
 - II. Ozone
 - III. Sulfur dioxide
- A. I only
 - B. II only
 - C. III only
 - D. I and III only

29. Which human activity is largely responsible for the human impact on the carbon cycle

- a. Deforestation
- b. Burning fossil fuels
- c. Calcination of limestone
- d. Human0caused land use and land cover change

30. Carbon in the atmosphere is most likely found as

- a. Carbon dioxide
- b. CFCs
- c. Hydrocarbons
- d. Methane
- e. Ozone

31. Which step of the nitrogen cycle uses both lightning and bacteria to aid the process

- A. Nitrogen fixation
- B. Assimilation
- C. Ammonification
- D. Denitrification

32. Which of the following species interactions is not considered an antagonistic interaction

- A. Carnivory
- B. Parasitism
- C. Predation
- D. Batesian mimicry

33. A population pyramid showing rapid growth

- A. Has a narrow base and bulges upward
- B. Narrows steadily from its base upward
- C. Has a broad base and curves upward
- D. Has a narrow base and widens

34. According to Thompson's Transition Model, a country in the post-industrial stage will have

- A. Slow population growth due to high births and deaths
- B. Rapid population growth
- C. Little population growth due to declining birth rates
- D. Zero population growth

35. White-breasted nuthatches and Downy woodpeckers both eat insects that hide in the furrows of bark in hardwood trees. The Downy woodpecker searches for insects by hunting from the bottom of the tree trunk to the top, while the White-breasted nuthatch searches from the top of the trunk down. These hunting behaviors best illustrate which of the following ecological concepts?

- A. Competitive Exclusion
- B. Resource Partitioning
- C. Character Displacement
- D. Keystone Species

36. Which of the following describes the relationship between ants and acacia trees?

- A. parasitism
- B. mutualism
- C. inhibition
- D. facilitation
- E. commensalism

37. Which of the following describes the relationship between legumes and nitrogen-fixing bacteria?

- A. parasitism
- B. mutualism
- C. inhibition
- D. facilitation
- E. commensalism

38. Ecologists are particularly concerned about pathogens because

- A. human activities are transporting pathogens around the world at alarming rates.
- B. pathogens are evolving faster than ever before.
- C. host organisms are not coming up with defenses against pathogens.
- D. new technologies have allowed microbiologists to classify more new pathogens.
- E. pathogens that infect organisms at the community level will eventually infect human beings.

39. The pyramid of numbers is inverted in the case of

- A. Parasitic Food Chain
- B. Grassland Ecosystem
- C. Forest Ecosystem
- D. Desert Ecosystem

40. The concept of ecological pyramid was first proposed by

- A. Charles Darwin
- B. A.G. Tansley
- C. Juday
- D. Charles Elton

41. The pyramid of numbers in a single tree is

- A. Upright
- B. Inverted
- C. Spindle Shaped
- D. None of these

42. The Red Data Book maintains a record of:

- A. Plants and animals present in the world
- B. Current relationship between man and biosphere
- C. Plants and animals which are known to be endangered
- D. Forest wealth in the whole world

43. Deserts cover approximately _____ of the earth's surface.

- A. 10%
- B. 20%
- C. 25%
- D. 35%

44. Deserts occur on every continent except:

- A. Europe
- B. Asia
- C. Antarctica
- D. There are deserts on every continent

45. The Mojave Desert is generally warm throughout the year and very hot in the summer. The winters usually bring little rainfall. This would be considered what type of desert?

- A. Semi arid
- B. Hot and Dry
- C. Coastal
- D. Cold

46. The Atacama Desert of Chile generally has cool winters followed by moderately long, warm summers. This describes what kind of desert?

- A. Coastal
- B. Semi arid

- C. Cold
- D. Hot and Dry

47. Which of the following is true about spiny plants?

- A. The spines produce enough shade to reduce transpiration
- B. Photosynthesis occurs only in the spines
- C. The spines are the major site for storing moisture
- D. All spiny plants are leafless

48. What characteristics of grasses allow them to thrive in the grassland biome?

- A. they grow from the bottom rather than the top, thus being able to rebound after a fire
- B. they require thick layers of healthy soil to grow
- C. they require constant rainfall
- D. all of the above

49. In their natural state, which of the following factors contribute to the maintenance of the grasslands:

- A. climate, topography, and grazing
- B. climate, topography, and fire
- C. topography, fire, and grazing
- D. climate, fire, and grazing

50. Which statement is true about the water (hydrologic) cycle?

- A. because this is a true cycle, it is impossible to run out of fresh water for human use
- B. some water evaporates from land and from plants
- C. all water molecules that evaporate from the ocean precipitate on land and move by gravity through groundwater to the ocean again
- D. once water sinks into the ground, it is safe from human exploitation or pollution until it has rejoined the ocean

51. What theory states that, within a species, populations in colder climates have larger body masses?

- A. Darwin's Law
- B. Bergmann's Rule of Ecogeography
- C. Theory of Succession
- D. Leopold's Law of Distribution

52. Of the following limiting factors affecting a population of prairie dogs on a prairie in Nebraska, which is/are density-independent rather than density-dependent?

- A. depth of the local drinking pond
- B. heat wave
- C. bacterial pneumonia
- D. population of coyotes
- E. all are density-dependent

53 Which of the following is not an example of a grassland biome?

- A. pampas
- B. tundra
- C. steppe
- D. prairie

54 Which of the following is often considered a transition region between desert and tropical rainforest?

- A. savanna
- B. prairie
- C. steppe
- D. pampas

55. The physical location where an organism lives is best described as the organism's

- A. life zone
- B. niche
- C. habitat
- D. community

56. The number of individuals per unit area or volume is known as the

- A. population density
- B. population distribution
- C. carrying capacity
- D. limiting factors

57. Everything else being equal, when the number of births exceeds the number of deaths, this results in

- A. population growth
- B. biotic potential
- C. environmental resistance
- D. carrying capacity

58. What do competition, predation and food availability have in common?

- A. They are all abiotic factors
- B. They are all biotic factors
- C. They are all limiting factors
- D. Nothing in common

59. Everything else being equal, when emigration rate is greater than immigration rate

- A. the population number decreases
- B. the population number increases
- C. the population number stays the same
- D. the population number fluctuates over time

60. Two species of Anolis lizard share the same niche and therefore compete for the same food sources (insects). However, *A. distichus* perches on fence posts and other sunny surfaces while *A. insolitus* usually perches on shady branches. This type of competition is called:

- A. commensalisms
- B. intraspecific competition
- C. competitive exclusion
- D. resource partitioning

PART B

Match the letters of each problem with the best correct human impact problem.

- A. Has a greater harmful impact on soil, water, air, and biodiversity than any other human activity.
- B. Requires large amounts of energy, resulting in scarring, erosion, and subsidence.
- C. Causes an increase of nitrate ions in runoff, loss of nutrients, and an increase of water runoff.
- D. Is typically caused by xenobiotic chemicals.
- E. Human activities such as car emissions and factory smokestacks contribute to this impact.
- F. Leads to a decrease in biodiversity through the rendering of land useless in supporting existing species.
- G. Overgrazing of cattle on arid land, salt buildup on irrigated soils, and soil compaction worsen drought and famine.
- H. Landfills can leak liquids into the groundwater and release 1/4th of all methane.
- I. Studies show that residue on vegetables and fruit may double a child's risk of ADHD.
- J. Overuse can result in nutrients being washed into streams and lakes causing algae blooms.

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| 61. _____ | Deforestation |
| 62. _____ | Desertification |
| 63. _____ | Soil pollution |
| 64. _____ | Solid Waste Disposal |
| 65. _____ | Mining Operations |
| 66. _____ | Air Pollution |
| 67. _____ | Habitat Destruction |
| 68. _____ | Agricultural Practices |
| 69. _____ | Pesticide Usage |
| 70. _____ | Fertilizer Usage |